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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/721,616
Filing Date: November 24, 2003
Appellant(s): SUGIURA ET AL.

Kevin J Canning
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 17th, 2010 appealing from the Office action mailed March 17th, 2010.

Real party in Interest

(1) A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

There are no related Appeals and Interferences to this Appeal.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection in the brief is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

Number	Name	Date
US 6,403,247 B1	Guthrie et al.	December 3rd, 1999
US 2001/0033954 A1	Gyoten et al.	April 10th, 2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over (U.S. Patent No. 6,403, 247 B1) in view of Gyoten et al. (U.S. Pub. No. 2001/0033954A1).

With respect to claims 1-2, Guthrie et al. disclose a fuel cell power plant wherein, with respect to separators sandwiching an electrode assembly, Guthrie et al. teach that conventional PEM fuels cells have the ion exchange membrane positioned between two gas-permeable, electrically conductive plates, referred to as the anode and cathode plates. The plates are typically formed from graphite, a graphite-polymer composite, or the like The plates act as a structural support for the two porous, electrically conductive electrodes, as well as serving as current collectors and providing the means for carrying the fuel and oxidant to the anode and cathode, respectively. They are also utilized for carrying away the reactant by-product water during operation of the fuel cell (Col 2 lines 25-40).

With respect to the coolant flow field configuration and supply and discharge passages, Guthrie et al. teach that FIG. 11 illustrates a cross-sectional view of a fuel cell power plant having an integrated manifold system according to another embodiment of the present invention, generally designated by numeral 700. As shown in FIG. 11, the fuel cell power plant 700 comprises two operatively connected fuel cell stacks, 702 and 704 respectively, which share a common, integrated oxidant flow manifold 706. The integrated oxidant flow manifold 706 is preferably formed from a lightweight dielectric reinforced plastic, such as but not limited to glass filled NORYL.TM. or the like. The fuel cell power plant 700 further includes an oxidant inlet manifold 710, an oxidant exhaust manifold 612, a pair of fuel inlet manifolds 730, a pair of fuel exhaust manifolds 732, a pair of coolant gas vents 742 (air release passage), a pair of coolant inlet manifolds 740 and a pair of coolant exhaust manifolds 744 which, acting in

conjunction with one another, provide the fuel cell power plant 700 with the necessary delivery and exhaust of reactant gasses and coolant (Col 13 lines 25-40) (See Fig. 11)

With respect to wherein the separator is in an upright position and a width of the separator is greater than a height of the separator, Guthrie et al disclose a separator in an upright position and a width of the separator is greater than a height of the separator (See. Fig. 5). Guthrie et al. also teach coolant inlet manifolds 240 and outlet manifolds 244.

Examiner notes that although the air release passage 742 of Guthrie et al. is not aligned with the discharge passage of Guthrie et al. the air release passage of Guthrie et al. is above the discharge passage 744 of Guthrie et al. as shown in Fig. 11.

With respect to said separator includes first and second metal plates, examiner notes that the stack of Guthrie et al. must include a second coolant separator plate in order to contain the cooling fluid (See Fig. 11).

With respect to the coolant supply passage being provided at a middle position of one end of said separator and coolant discharge passage is provided at a middle positon at the other end of said separator presents no novel or unexpected result over the location of the coolant supply and discharge passages in the Guthrie et al. reference. The positioning of the coolant supply and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco

Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

With respect to the wherein the air releasing passage is aligned with the coolant discharge passage on the same side of the separator as the coolant discharge passage is positioned presents no novel or unexpected result over the location of the air-releasing and discharge passages in the Guthrie et al. reference. The positioning of the air releasing and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. Since both the prior art and Applicant's air-releasing serves the same purpose of releasing air that might be entrained within the incoming coolant flow. And both the prior art and the Applicants air-releasing passage is located at an opposite end of the incoming coolant passage to facilitate bleeding of any entrained air. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

Guthrie et al. do not specifically teach metallic separator plates, however, Gyoten et al. disclose a fuel cell system wherein, for the separator plates, a carbon material which is electrically conductive and has both gas tightness and corrosion resistance is often used. However, metallic separator plates such as stainless steel are also used in view of its good processability and inexpensiveness, and also from the viewpoint that thinner separator plates can be obtained. (Paragraph 0006) Therefore it would have

been obvious to one of ordinary skill in the art to use metallic separator plates of Gyoten et al. in the fuel cell system of Guthrie et al. because Gyoten et al. teach that metallic separator plates such as stainless steel are also used in view of its good processability and inexpensiveness, and also from the viewpoint that thinner separator plates can be obtained (Paragraph 0006).

With respect to claims 5 and 6, Examiner notes that the flow path of the reactant gasses of Guthrie et al. follow a serpentine path (See Fig. 11.). With respect to said separator includes first and second metal plates, examiner notes that the stack of Guthrie et al. must include a second coolant separator plate in order to contain the cooling fluid (See Fig. 11).

(10) Response to Argument

Applicant state that: *Applicants respectfully submit that Guthrie and Gyoten, alone or in any reasonable combination, do not disclose or suggest at least a coolant supply passage provided at a middle position of one vertical end of said separator, and a coolant discharge passage provided at a middle position of the other vertical end of said separator, wherein the air-releasing passage is aligned with the coolant discharge*

passage on the same side of the separator as the coolant discharge passage is positioned, as recited in claim 1.

The Examiner does not allege that Gyoten teaches these features of claim 1; instead, Gyoten is relied upon only for metallic separator plates (Office Action at page 5). Indeed, while Gyoten discusses fuel cells, Gyoten does not have an air-releasing passage akin to the one recited in claim 1. Accordingly, Gyoten does not discuss where such an air-releasing passage might be located on the separator. In fact, Gyoten does not even discuss the use of coolant or a coolant flow path, to which the air-releasing passage could be connected. Thus, Gyoten is entirely silent with respect to the above-quoted features of claim 1. Thus, in comparison to the present application, Guthrie provides the coolant gas vent in exactly the opposite position from the coolant discharge passage: the present application aligns the air-releasing passage with the coolant discharge passage on the same side of the separator, while Guthrie provides the vent in the opposite corner from the coolant outlet manifold.

The Examiner does not argue that Guthrie discloses or suggests these features of claim 1; indeed the Examiner recognizes that Guthrie fails to disclose or suggest these features (Office Action at pages 4-5). Rather, the Examiner asserts that these features "solve no stated problem and would be an obvious matter of design choice." Applicants respectfully disagree. Applicants respectfully disagree that the recited features solve no technical problem. Claim 1 recites a specific structure (i.e. a particular configuration of the supply passage, discharge passage, air-releasing passage, and coolant flow field). This recited structure is directly responsible for the function of the

fuel cell stack which solves the stated problem. For example, because the air releasing passage is aligned with the coolant discharge passage on the same side of the separator in the claimed invention, the air in the coolant is carried across the separator by the coolant as the coolant moves towards the coolant discharge passage. This allows most of the air to be reliably discharged from the coolant flow field, because the air is both encouraged upwards (due to the air being lighter than the coolant) and towards the appropriate end of the separator (due to the motion of the coolant). This problem and solution are described in the Specification at pages 5-6. Thus, the claimed configuration solves two stated problems: the air is naturally encouraged (by buoyancy) towards, and becomes trapped at, the top of the separator; and the air is encouraged (by the flow of the coolant) towards the coolant discharge passage, and becomes trapped near the end of the coolant flow field.

Even though Guthrie' s vent is placed on top of the separator, Guthrie' s vent is in the wrong horizontal alignment and the coolant inlet and outlet manifolds are also provided in the wrong location. Hence, Guthrie does not allow air encouraged by the flow of the coolant towards the end of the coolant flow field to escape. Indeed, the Guthrie reference specifically arranges the various parts of fuel cell in way that makes the problem worse.

In response Examiner notes that: With respect to the wherein the air releasing passage is aligned with the coolant discharge passage on the same side of the separator as the coolant discharge passage is positioned presents no novel or unexpected result over the location of the air-releasing and discharge passages in the

Guthrie et al. reference. The positioning of the air releasing and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. Since both the prior art and Applicant's air-releasing serves the same purpose of releasing air that might be entrained within the incoming coolant flow. And both the prior art and the Applicants air-releasing passage is located at an opposite end of the incoming coolant passage to facilitate bleeding of any entrained air. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

Examiner also notes that the coolant gas vents 742 (air release passage) of Guthrie are capable of releasing air in the coolant stream upon entering through port 740 where the gas vents 742 of Guthrie are aligned with the inlet 740 of Guthrie. Since Applicant positioning of the air releasing and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. Then both the prior art and Applicant's air-releasing serves the same purpose of releasing air that might be entrained within the incoming coolant flow. And both the prior art and the Applicants air-releasing passage are located at an opposite end of the incoming coolant passage to facilitate bleeding of any entrained air.

Applicant state that: *Guthrie notes that a number of different configurations for a fuel cell can be used. However, the one common feature that Guthrie requires from each embodiment is that a common manifold be used between a pair of fuel cell stacks for sharing either the oxidant gas or the fuel gas between the fuel cells (Guthrie at Abstract and column 13, lines 56-65, stating "it is a major aspect of the present invention ... to provide a common, integrated manifold system which is applicable to a fuel cell power plant"). The modifications proposed by the Examiner would undermine the operation of Guthrie's common manifold in such a way that would render Guthrie unsuitable for Guthrie's intended purpose. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification, see Manual of Patent Examining Procedure at §2143.01.V; see also In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (A prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were primafacie obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.).*

Modifying Guthrie's structure as suggested by the Examiner would render Guthrie unsuitable for the intended purpose of providing a common manifold which provides a uniform flow of reactant gases across the fuel cells. Such a modification would require that the coolant passages be provided in the location currently occupied by the common reactant gas manifold (which, as Guthrie notes, can be used for either the oxidant gas or the fuel gas; see Guthrie at column 3, lines 27-48). Thus, the proposed modification would require that the manifolds be provided with passages for accommodating the coolant inlets and outlets.

In response Examiner notes that: With respect to the coolant supply passage being provided at a middle position of one end of said separator and coolant discharge passage is provided at a middle position at the other end of said separator presents no novel or unexpected result over the location of the coolant supply and discharge passages in the Guthrie et al. reference. The positioning of the coolant supply and discharge passages in lieu of those used in the references solves no stated problem and would be an obvious matter of design choice within the skill of the art. In re Launder, 42 CCPA 886, 222 F.2d 371, 105 USPQ 446 (1955); Flour City Architectural Metals v. Alpana Aluminum Products, Inc., 454 F. 2d 98, 172 USPQ 341 (8th Cir. 1972); National Connector Corp. v. Malco Manufacturing Co., 392 F.2d 766. 157 USPQ 401 (8th Cir.) cert. denied, 393 U.S. 923, 159 USPQ 799 (1968).

Examiner also notes that Applicant has not answered the issue of criticality for positioning of the coolant passage at a middle position of the separator.

For the above reasons, it is believed that all the rejections should be sustained.

(11) Related Proceedings Appendix –37 C.F.R. 41.37 (c)(1)(x)

There are no related proceedings to this Appeal.

.For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Ben Lewis/

Examiner, Art Unit 1726

Conferees:

/Patrick Ryan/

Patrick J. Ryan
SPE, Art Unit 1726

/William Krynski/

William Krynski
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